

Claims

1. An antenna coupler for mobile radio terminals (0),
with the antenna coupler being provided with an
5 interface (50; 36, 37; 65, 77) for connection of an
external antenna (52), in particular a motor vehicle
antenna, and with a coupling structure for
electromagnetic coupling of RF signals between the
antenna coupler and the antenna of a mobile radio
10 terminal (0) which is located in the vicinity of the
antenna coupler,
characterized

in that the coupling structure is in the form of a two-
layer or multilayer coupling structure with two or more
15 coupling structure elements (2, 3; 62, 63; 72, 73, 74)
arranged one above the other.

2. The antenna coupler as claimed in claim 1,
characterized
20 in that the two or more coupling structure elements (2,
3; 62, 63; 72, 73, 74) are arranged on essentially
mutually parallel planes and at a distance from one
another.

25 3. The antenna coupler as claimed in one of the
preceding claims,
characterized
in that the two or more coupling structure elements (2,
3; 62, 63; 72, 73, 74) are arranged one above the other
30 separated from one another by three to six millimeters.

4. The antenna coupler as claimed in one of the
preceding claims,
characterized
35 in that a first coupling structure element (2; 8)
comprises two or more differently shaped structure
elements (22, 23; 82, 83) which are intended for
different wavelength ranges.

5. The antenna coupler as claimed in claim 4,
characterized
in that the first coupling structure element (2; 8) has
two structure elements (22, 23; 82, 83) whose
5 orientation directions are rotated through 90° .

6. The antenna coupler as claimed in one of claims 4
or 5,
characterized
10 in that a second coupling structure element (3)
comprises two or more differently shaped structure
elements (31, 321, 322, 323, 324) which are coupled to
one another.

15 7. The antenna coupler as claimed in one of the
preceding claims,
characterized
in that one coupling structure element (2, 3; 62, 63;
72, 73, 74) is in each case composed of a conductive
20 material which is applied to one face of a mount
substrate (21, 81), in particular of a board.

8. The antenna coupler as claimed in claim 7,
characterized
25 in that two or more structure elements (31, 321, 322,
323, 324) composed of a conductive material are applied
to the mount substrate (39) and can be connected to one
another for tuning, in particular by means of
capacitors or coils.

30 9. The antenna coupler as claimed in one of the
preceding claims,
characterized
in that the two or more coupling structure elements (2,
35 3; 62, 63; 72, 73, 74) are each composed of a
conductive material which is applied to a respectively
associated thin dielectric mount substrate body (21,
39, 81), and the dielectric mount substrate bodies are
arranged one above the other, at a distance from one

another.

10. The antenna coupler as claimed in claim 9,
characterized

5 in that the antenna body has one or more electrical
connecting elements (4, 64, 75, 76) which are arranged
between mount substrate bodies.

11. The antenna coupler as claimed in claim 10,
10 characterized
in that one electrical connecting element has one or
more electrically conductive contact elements which are
mounted in a sprung form and engage on correspondingly
shaped contact surfaces.

15 12. The antenna coupler as claimed in one of claims 9
to 11,
characterized
in that an RF coupling element (35) for coupling two or
20 more structure elements (22, 23; 82, 85) which are
applied to a second mount substrate body (21; 91) is
arranged on a first mount substrate body (39).

13. The antenna coupler as claimed in one of claims 9
25 to 12,
characterized
in that the mount substrate body is composed of a
flexible material.

30 14. The antenna coupler as claimed in one of claims 9
to 13,
characterized
in that the mount substrate body (39) has one or more
internal milled areas (341, 342, 343) which are
35 arranged between the conductor surfaces of coupling
structure elements (31, 321, 322, 323, 324).

15. A holder (1, 6, 7) for a mobile radio (0) with the
holder (1, 6, 7) being provided with an interface (50,

77) for connection of an external antenna (52), in particular of a motor vehicle antenna, and having a coupling structure for electromagnetic coupling of RF signals between the holder (1, 6, 7) and the antenna (52) of a mobile radio terminal (0) which is located in the holder, and with the coupling structure being arranged in the holder (1, 6, 7) in such a way that, when the mobile radio (0) is inserted, the coupling structure is positioned in the vicinity of the mobile radio (0),

characterized

in that the coupling structure is in the form of a two-layer or multilayer coupling structure with two or more coupling structure elements (2, 3; 62, 63; 72, 73, 74) arranged one above the other.

16. The holder as claimed in claim 15, characterized

in that the coupling structure is arranged in the holder (1, 6, 7) in such a way that, when the mobile radio (0) is inserted, the coupling structure is positioned in the immediate vicinity of the antenna of the mobile radio.

17. The holder as claimed in claim 15 or claim 16, characterized

in that one coupling structure element (72) is connected, in particular adhesively bonded, to the housing (71) of the holder (7).

18. The holder as claimed in one of claims 15 to 17, characterized

in that one coupling structure element (72) is arranged on the inner face of the housing (71) of the holder (7), in the immediate vicinity of the antenna of the mobile radio (0).

19. The holder as claimed in one of claims 15 to 18, characterized

in that the two or more coupling structure elements are arranged at a distance from one another on planes which are essentially parallel to one another, with the parallel planes being aligned at right angles to the
5 main emission direction of the mobile radio terminal.